

CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. (Currently Amended) A direct-to-digital holography system, comprising:
an illumination lens operable to focus a reference beam;
a beam splitter optically coupled to the illumination lens by the reference beam; and
a reference mirror located at a waist of the reference beam and optically coupled to the illumination lens via the beam splitter ~~oriented relative to the beam splitter and illumination lens~~ such that the reference beam is reflected from the reference mirror to the beam splitter in order to eliminate the need for a reference objective on a reference arm.
2. (Original) The system of Claim 1, wherein the beam splitter comprises a cube beam splitter operable to eliminate first order reflections.
3. (Original) The system of Claim 1, further comprising a quarter-wave plate optically coupled between the beam splitter and the reference mirror.
4. (Original) The system of Claim 1, wherein the reference beam comprises a Gaussian beam.
5. (Original) The system of Claim 1, wherein the reference mirror comprises a flat mirror.
6. (Previously Presented) The system of Claim 1, further comprising the reference mirror operable to maintain optical symmetry of the reference arm and a target arm.

7. (Original) The system of Claim 1, further comprising the reference mirror operable to form a first wavefront substantially similar to a second wavefront formed by the reference objective.

8. (Currently Amended) A method for acquiring a complex image in a direct-to-digital holography system, comprising:

focusing a reference beam with an illumination lens, the reference beam including a waist;

transmitting at least a portion of the reference beam through a beam splitter; and

reflecting the portion of the reference beam from a reference mirror located at the waist of the reference beam and optically coupled to the illumination lens via the beam splitter ~~oriented relative to the beam splitter and illumination lens~~ such that the reference beam is reflected from the reference mirror to the beam splitter, the reference mirror eliminating the need for a reference objective on a reference arm.

9. (Cancelled)

10. (Previously Presented) The method of Claim 8, further comprising forming a combined wavefront at a digital recorder, the wavefront substantially similar to a wavefront produced by the reference objective.

11. (Previously Presented) The method of Claim 8, further comprising the reference mirror operable to maintain optical symmetry of the reference arm and a target arm.

12. (Original) The method of Claim 8, wherein the reference beam comprises a Gaussian beam.

13-32. (Cancelled)

33. (Previously Presented) The method of Claim 8, further comprising the reference mirror operable to form a first wavefront substantially similar to a second wavefront formed by the reference objective.

34. (Previously Presented) The method of Claim 8, wherein the reference mirror comprises a flat mirror.